

CLAIMS :

1. A dynamo electric machine comprising a stator core having a plurality of slots formed around the circumferential thereof each extending continuously in axial direction thereof and a stator winding formed by disposing a plurality of unit windings in the plurality of slots in such a manner that one of two side sections of a unit winding is disposed in a slot other than a slot where the other side section of the unit winding is disposed while crossing over a plurality of slots, wherein each of the plurality of unit windings is formed by being divided at least into a first winding section of which one of end sections is opened, opposing side sections are shaped so as to form a step in the radial direction of the stator core, the open ends of opened end sections oppose each other in the radial direction of the stator core and the opened end sections are bent in an crossing over direction of the winding, and a second winding section connecting the open ends of the first winding section.

2. A dynamo electric machine of claim 1, wherein the unit windings having different crossing over directions are disposed and laminated in each of the plurality of slots in its depth direction.

3. A dynamo electric machine of claim 1, wherein each of the plurality of unit windings is formed by laminating a plurality of flat plate shaped winding conductors.

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4. A dynamo electric machine of claim 3, wherein each of the plurality of unit windings is disposed in one of the slots in such a manner that the laminating direction of the winding conductors coincides with the
10 latitudinal direction of the slot.

5. A dynamo electric machine of claim 1, wherein each of the plurality of unit windings is constituted in such a manner that among at least two winding
15 conductors constituting the first winding section one open end of one winding conductor and other open end of the other winding conductor are connected by inserting a winding conductor piece constituting the second winding section so that winding conductors
20 having a plurality of turns are formed.

6. A dynamo electric machine of claim 1, wherein each of the plurality of unit windings is shaped in such a manner that the end section opposite from the opened
25 end section has substantially the same shape as the opened end section.

7. A dynamo electric machine comprising a stator core having a plurality of slots formed around the circumferential thereof each extending continuously in axial direction thereof and a stator winding formed by disposing a plurality of unit windings in the plurality of slots in such a manner that one of two side sections of a unit winding is disposed in a slot other than a slot where the other side section of the unit winding is disposed while crossing over a plurality of slots, wherein each of the plurality of unit windings is formed by being divided at least into a first winding section having open ends of opened end portion and a second winding section connecting the open ends of the first winding section, at least one of respective end sections of the plurality of unit windings is formed by the first and second winding sections in such a manner that two portions which project from the end in the axial direction of the stator core to the outside in the axial direction of the stator core are bent in the crossing over direction of the winding, a step in the radial direction of the stator core is formed between the two portions and a twisted portion between the two portions is extended in the radial direction of the stator core.

8. A dynamo electric machine of claim 7, wherein the

unit windings having different crossing over directions are disposed and laminated in each of the plurality of slots in its depth direction.

- 5 9. A dynamo electric machine of claim 7, wherein each of the plurality of unit windings is formed by laminating a plurality of flat plate shaped winding conductors.
- 10 10. A dynamo electric machine of claim 7, wherein each of the plurality of unit windings is constituted in such a manner that among at least two winding conductors constituting the first winding section one open end of one winding conductor and other open end
15 of the other winding conductor are connected by inserting a winding conductor piece constituting the second winding section so that winding conductors having a plurality of turns are formed.
- 20 11. A dynamo electric machine of claim 7, wherein each of the plurality of unit windings is shaped in such a manner that the end section opposite from the opened end section has substantially the same shape as the opened end section.
12. A method of manufacturing a dynamo electric machine in which one of side sections of each of a

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DEC 29 1956

Class 29/596
12/20/56
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plurality of unit windings is disposed in one of a plurality of slots formed on a stator core other than another slot in which the other side section thereof is disposed by crossing over a predetermined plurality of slots wherein a first winding section of the unit winding having a straight shaped open end sections at the one side thereof is formed in advance in such a manner that a laminate of a plurality of straight shaped winding conductors is twisted at the midway thereof to form a crossing over width between two side sections formed which permits to cross over a plurality of slots as well as to form a step in the radial direction of the stator core between the two side sections, two open ends of opened end sections of the first winding section are inserted into two of the plurality of slots from one of two ends in the axial direction of the stator core, the straight shape opened end sections of the first winding section which project from the other end portion in the axial direction of the stator core are bent in the crossing over direction of the winding so as to oppose the open ends in the radial direction of the stator core, the open ends of the opened end sections of the first winding section are connected by a winding conductor piece constituting a second winding section of the unit winding, and above series of steps is repeated by the number of unit windings to be disposed in the

Patented 1960

Coils
inserted
radially

plurality of slots so as to constitute a stator winding.

13. A dynamo electric machine of claim 12, wherein the
5 unit windings having different crossing over
directions are disposed and laminated in each of the
plurality of slots in its depth direction.

14. A dynamo electric machine of claim 12, wherein
10 each of the plurality of unit windings is formed by
laminating a plurality of flat plate shaped winding
conductors.

15. A dynamo electric machine of claim 12, wherein
15 each of the plurality of unit windings is disposed in
one of the slots in such a manner that the laminating
direction of the winding conductors coincides with the
latitudinal direction of the slot.

20 16. A dynamo electric machine of claim 12, wherein
each of the plurality of unit windings is constituted
in such a manner that among at least two winding
conductors constituting the first winding section one
open end of one winding conductor and other open end
25 of the other winding conductor are connected by
inserting a winding conductor piece constituting the
second winding section so that winding conductors

having a plurality of turns are formed.

17. A dynamo electric machine of claim 12, wherein each of the plurality of unit windings is shaped in
5 such a manner that the end section opposite from the opened end section has substantially the same shape as the opened end section.

Patented Dec 12, 1961